

UNIVERSITI SAINS MALAYSIA

Second Semester Examination  
Academic Session 2004/2005

March 2005

**IWK 202E – Products Based On Bio-resource**  
***[Produk Berasaskan Bio-sumber]***

Masa: 3 jam

Please check that this examination paper consists of FIVE (5) pages of printed material before you begin the examination.

*[Sila pastikan bahawa kertas peperiksaan ini mengandungi LIMA (5) muka surat yang bercetak sebelum anda memulakan peperiksaan ini.]*

Answer **FIVE (5)** questions. All questions can be answered either in Bahasa Malaysia or English.

*Jawab **LIMA (5)** soalan. Semua soalan boleh dijawab sama ada dalam Bahasa Malaysia atau Bahasa Inggeris*

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1. (a) Discuss briefly the structural differences between the hemicelluloses of hardwood and softwood species. (40 marks)
- (b) Write short notes on any **two** of the following :
- (i) Arabinogalactans and glucans
  - (ii) Amylose and amylopectin
  - (iii) Applications of hemicelluloses
- (60 marks)
- (a) *Terangkan dengan ringkas perbezaan struktur di antara hemiselulosa kayu keras dan hemiselulosa kayu lembut.* (40 markah)
- (b) *Tulis nota ringkas bagi mana-mana dua perkara berikut:*
- (i) *Arabinogalaktan dan Glukan*
  - (ii) *Amilosa dan amilopektin*
  - (iii) *Aplikasi hemiselulosa*
- (60 markah)
2. (a) Describe briefly the experiments conducted to show the evidence of the presence of phenyl propane units in lignin (40 marks)
- (b) Write short notes on any **one** of the following:
- (i) Lignin-carbohydrate complexes
  - (ii) *In vitro* preparation of lignin as Dehydrogenation Polymer (DHP) from coniferyl alcohol.
- (60 marks)

- (a) *Terangkan dengan ringkas eksperimen yang dijalankan untuk membuktikan kewujudan phenyl propane dalam unit lignin.*  
(40 markah)
- (b) *Tulis nota ringkas bagi mana-mana satu perkara berikut:*
- (i) *Kompleks Lignin- karbohidrat*
  - (ii) *Penyediaan In vitro lignin sebagai polimer pendehidrogenan (DHP) dari koniferil alkohol.*
- (60 markah)
3. (a) Discuss briefly the crystalline modifications of cellulose  
(40 marks)
- (b) Write short notes on the following::
- (i) Cellulose acetate
  - (ii) Solvents for cellulose
- (60 marks)
- (a) *Terangkan dengan ringkas modifikasi hablur selulosa.*  
(40 markah)
- (b) *Tuliskan nota pendek mengenai perkara berikut.*
- (i) *selulosa xantat*
  - (ii) *pelarut bagi selulosa*
- (60 markah)

4. (a) Discuss the physical characteristics of wood which determine its technical suitability for the manufacture of veneer based panels. (50 marks)
- (b) Discuss the procedures involve in producing medium density fiberboard using the dry process. (50 marks)
- (a) *Bincangkan sifat fizikal kayu yang menentukan kesesuaian teknikal dalam menghasilkan panel berasaskan venir.* (50 markah)
- (b) *Bincangkan prosedur yang terlibat untuk menghasilkan bod gentian ketumpatan sederhana menggunakan kaedah kering.* (50 markah)
5. (a) Describe the principle involve in producing particles using ring flaker, hammer mill and attrition mill. (50 marks)
- (b) Explain how mat formation is done for particle based panels. (50 marks)
- (a) *Nyatakan prinsip yang terlibat dalam menghasilkan partikel menggunakan "ring flaker", "hammer mill" dan "attrition mill".* (50 markah)
- (b) *Terangkan bagaimana formasi mat dilakukan bagi panel berasaskan partikel.* (50 markah)

6. Write short notes of the following:

- (a) Tight side
- (b) Veneer Lathe X-Y charger
- (c) Adhesive spread
- (d) Continuous hot press
- (e) Tempering
- (f) Pressurized disk refiner
- (g) Short retention blender
- (h) Extender
- (i) Assembly
- (j) Pre press

(10 marks each)

*Tuliskan keterangan ringkas mengenai berikut:*

- (a) *“Tight side”*
- (b) *“Veneer Lathe X-Y Charger”*
- (c) *“Adhesive spread”*
- (d) *“Continuous hot press”*
- (e) *“Tempering”*
- (f) *Pressurized disk refiner”*
- (g) *“Short retention blender”*
- (h) *“Extender”*
- (i) *“Assembly”*
- (j) *“Pre press”*

*(10 markah setiap satu)*